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TWO NEW SPECIES OF ERRANT POLYCHAETES FROM THE GULF OF CALIFORNIA, MEXICO

JERRY D. KUDENOV[1]

ABSTRACT: Two new species of errant polychaetes from the Gulf of California, Mexico, are described. A key to the species of *Malmgrenia* is presented.

The Aphroditid polychaetes are frequently collected by shrimp trawlers in the Gulf of California, Mexico. *Aphrodita mexicana* Kudenov, in press, was described from such material. A new species from the northern Sea of Cortez is described. During comparisons of these two species, a small polynoid was discovered in the lateral setae of *A. mexicana*. Subsequent examination revealed that it too is a new species of a genus unreported previously from the Gulf. These materials are deposited in the Allan Hancock Foundation, University of Southern California.

FAMILY APHRODITIDAE

Aphrodita sonorae, new species

Figure 1

Material examined: 31° 14′ N, 113° 55′ W, 36 m, silty sand, 9 November 1973, coll. Ramon Durazo (4, TYPE).

Description: The body is elliptical. The caudal region is attenuate. There are 45 segments. The average length of four specimens is 47 mm and the width is 28 mm. The type specimen is 50 mm × 28 mm. The dorsum is somewhat encrusted with debris; all notosetae are visible above the felt. The lateral setae are whitish yellow to coppery colored. The ventrum is moderately covered with very small tubercles.

The prostomium is globulate in shape (Fig. 1a). There are two pairs of eyes; each pair is located on a distinct peduncle. A median ridge terminates as an inflated lobe on the posterior margin of the prostomium. The palpi are four times as long as the prostomium. They are coarsely ciliated, particularly along palpal ridges. The median tentacle is reduced to a small tubercle. The facial tubercle is as long as the prostomium; it is lightly tuberculate.

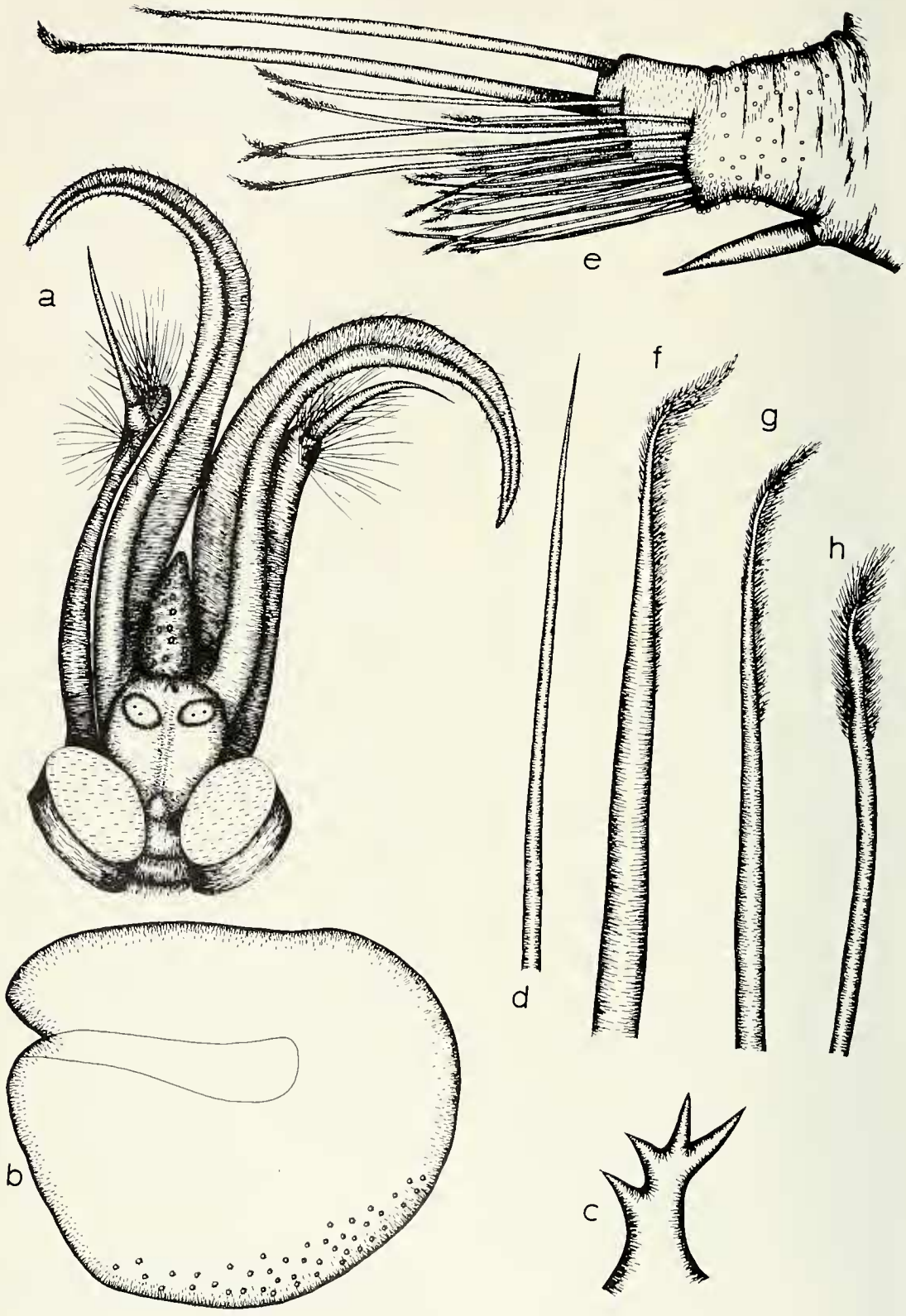
There are 15 pairs of translucent elytra (Fig. 1b). They are petaloid anteriorly and elliptical posteriorly. A lateral notch is present where each elytron is attached to the body. Venation is absent. Fine tubercles are present on the posterior surface of each elytron. Elytral margins are entire.

There are 19 pairs of branchiae (Fig. 1c). They are present on cirriferous segments 6–36, and are best developed from segments 12–20 as four lobed processes.

The notosetae are pale copper in color. They are long, curved and slender; all terminate in straight points (Fig. 1d). The neurosetae are arranged in three tiers (Fig. 1e). The superior tier has 2 large, reddish brown hirsute setae (Fig. 1f); the intermediate tier has 5–6 lighter reddish brown ones (Fig. 1g); the inferior tier has 16–19 golden brown ones (Fig. 1h). All setae are essentially straight; the inferior neurosetae are distally constricted.

Remarks: *Aphrodita sonorae* resembles *A. mexicana* because the median tentacle is reduced to a

[1] Dept. Biol. Sci., Univ. Arizona, Tucson, Arizona 85721 (*Present Address*: Marine Pollution Studies Group, Fisheries and Wildlife Division, 605 Flinders Street, Melbourne, Victoria, 3000, Australia).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tubercle. *Aphrodita sonorae* is separable from *A. mexicana* because the former species has ocular peduncles; the latter has sessile eyes. The palpi of *A. sonorae* are relatively short and coarsely ciliated; they are longer and finely ciliated in *A. mexicana*. The elytra of the latter species are circular to elliptical, white and smooth. Those of *A. sonorae* are petaloid to elliptical, translucent and tuberculate. The notosetae of *A. sonorae* penetrate the dorsal felt and terminate in straight, slender tips; those of *A. mexicana* do not penetrate the felt and are distally recurved. There are 2 superior, 5–6 intermediate and 16–19 inferior neurosetae in *A. sonorae*; *A. mexicana* has 2, 3–8 (usually 4–5) and 9–19 (usually 13–14). The neurosetae of both species are essentially straight and distally pilose. The inferior neurosetae of *A. sonorae* are distally constricted; such shapes are absent in *A. mexicana*.

FAMILY POLYNOIDAE

Malmgrenia hartmanae, new species

Figure 2

Material examined: 31° 10′ N, 113° 50′ W, 40 m, 28 February 1971, coll. R. C. Brusca (2); found in the lateral setae of *Aphrodita mexicana* by K. Zimmerman (1, TYPE).

Description: The body is elongate and flat; it is 6 mm long by 1.75 mm wide. There are 30 segments. The elytra imbricate with one another and nearly cover the body. Only the sensory appendages and setae are exposed. A pair of cylindrical anal cirri are present.

The prostomium is elliptical (Fig. 2a); it is divided into two equal lobes by a median groove. The anterior pair of eyes is larger than the posterior pair. The frontal antennae are nearly continuous with the anterior margin of the prostomium, but are inserted on its ventral surface. The facial tubercle is longer than wide; the median antenna is distally inflated. The frontal antennae are two-thirds the length of the median antenna. The palpi are twice as long as the prostomium. They are cirriform and round in cross section. Cirrophoral setae are present.

The parapodia are well defined (Fig. 2b). The notopodia are small lobes set on top of the larger, laterally compressed neuropodial lobes. The acicular lobe of the neuropodium is distally rounded. A flat superior lobe is present on the acicular lobe. The postsetal lobe is nearly obscured by the acicular lobe. The distal inferior margin of the neuropodium is folded. Each neuropodium is dorsoventrally excavate where the neurosetae emerge. The dorsal cirri are cirriform and smooth; they extend beyond the neurosetae. The dorsal cirrophores are longer than wide. The ventral cirri are subulate, and are inserted on the proximal half of the neuropodium.

There are 15 pairs of elytra. Anterior and posterior elytra are elliptical; middle elytra are "D" shaped (Fig. 2c). The inner lateral margin of each middle elytron is straight. An anterior patch of submarginal tubercles is present on each elytron. All elytra are entire, reticulated (Fig. 2d), and are light brown in color.

Notopodial fascicles resemble whorls of thin, yellow colored notosetae (Fig. 2e). A single row of spinules is present on each notoseta. The inferior notosetae are longer than superior ones. The neurosetal fascicles resemble fans. The neurosetae are longer and wider than the notosetae. A series of 4–6 transversely serrated plates are present on each neuroseta (Fig. 2f,g). All neurosetae are bidentate; the accessory tooth is conical and stout; the distal hook is slightly recurved.

Remarks: *Malmgrenia hartmanae* resembles *M. marquesensis* (Monro, 1928) and possibly also *M. whiteavesii* McIntosh, 1874, because the notosetae have single rows of denticles. McIntosh's description of *M. whiteavesii* is brief, and it is not clear whether the notosetae have single rows of spinules. *Malmgrenia hartmanae* differs from *M. marquesensis* because its neurosetae are larger than the notosetae. The notosetae of the latter species are much larger than the neurosetae. The neurosetae of *M. whiteavesii* are of two kinds. *Malmgrenia hartmanae* differs from *M. whiteavesii* because it has one kind of neuroseta. *Malmgrenia hartmanae* has diagnostic elytra that are completely reticulated and "D" shaped. *Malmgrenia nigralba* Berkeley, 1923, has white reticulae restricted to posterior elytral surfaces.

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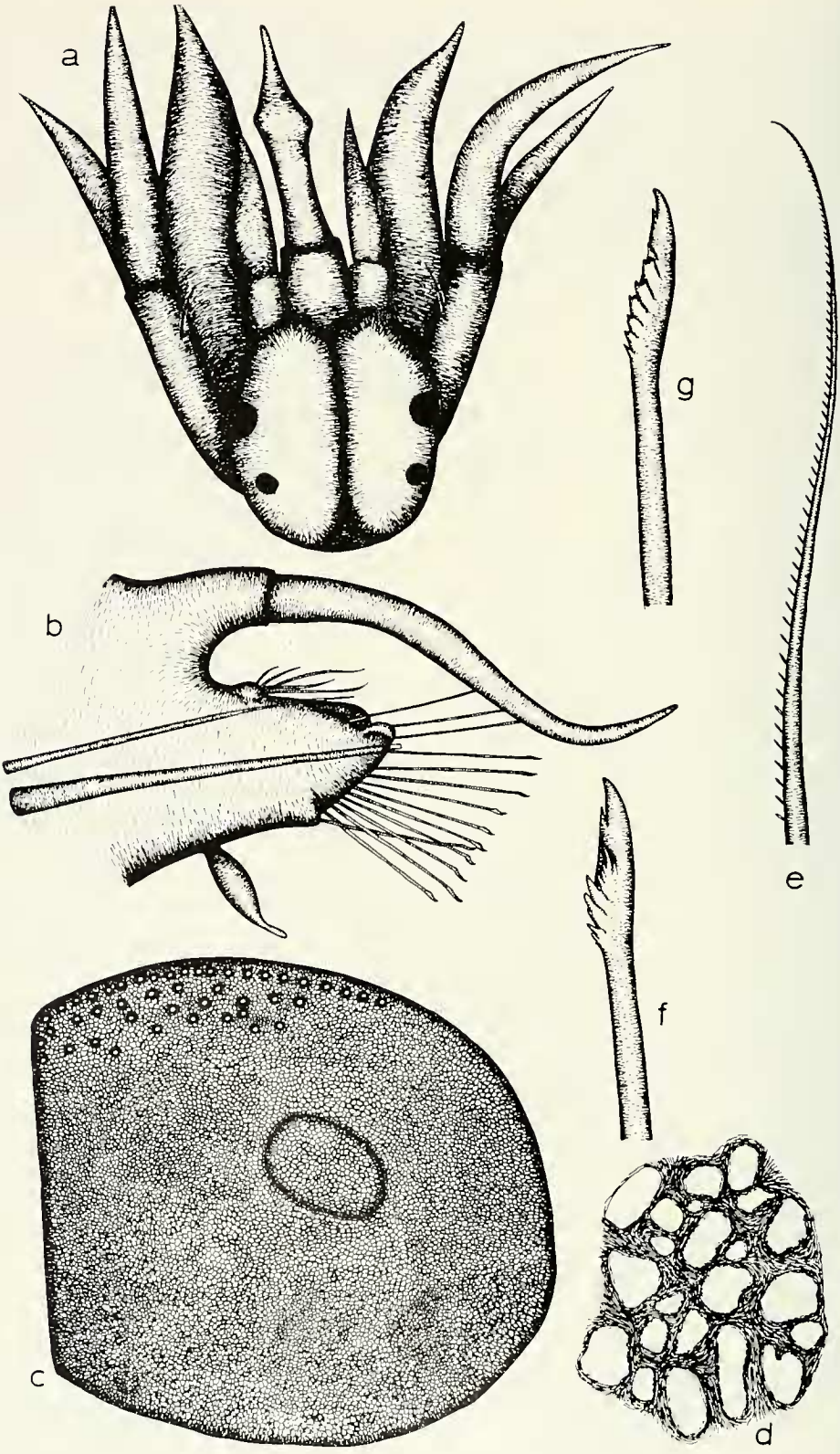
Figure 1. Aphrodita sonorae, new species: a, anterior segments, dorsal view, × 22; b, left elytron from segment 11, dorsal view, × 6.6; c, right branchia from segment 12, anterior view, × 22; d, notoseta, dorsal view, × 79; e, left parapodium from segment 16, posterior view, × 22; f, superior neuroseta, lateral view, × 79; g, intermediate neuroseta, lateral view, × 79; h, inferior neuroseta, lateral view, × 79.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but its elytra are circular to reniform. This species is named in honor of the late Olga Hartman, Allan Hancock Foundation, University of Southern California.

A total of 11 species are now present in *Malmgrenia*. The affinities of three species, *M. alba* (Malmgren, 1865), *M. ampulliferoides* Uschakov and Wu, 1959, and *M. castanea* McIntosh, 1876, are not clear. These species need to be re-examined. According to Hartman (1959), the generic status of *M. castanea* is confused. Specimens of these and other *Malmgrenia* species could not be obtained for detailed examinations. A key to this genus is presented below. Since it is based upon literature descriptions, some of which are incomplete, the key must be considered preliminary and tentative pending first hand examination of the type materials. *Malmgrenia alba*, *M. ampulliferoides*, and *M. castanea* have not been included in this key.

KEY TO THE SPECIES OF *MALMGRENIA*

1a. Notosetae are distally bidentate ..... *M. curacaöensis* Augener, 1927
b. Notosetae are distally entire 2
2a. Notosetae with transverse plates along the convex margin 3
Notosetae with transverse serrations along the convex margin 4
b. Notosetae with a single row of denticles along the convex margin 5
3a. Bidentate neurosetae with 12–20 transverse plates distributed all along the cutting surface ..... *M. micropoides* Augener, 1918
b. Bidentate neurosetae with 7–10 transverse plates restricted to the posterior half of the cutting surface ..... *M. nesiotes* (Chamberlin, 1919)
4a. Neurosetae with 25 transverse rows of spinules; accessory tooth minute and sometimes absent; elytra not reticulated ..... *M. purpura* Day, 1960
b. Neurosetae with less than 25 transverse rows of spinules; accessory tooth minute and generally absent; elytra reticulated ..... *M. nigralba* Berkeley, 1923
5a. Neurosetae are of two types ..... *M. whiteavesii* McIntosh, 1874
b. Neurosetae are of one type 6
6a. Neurosetae thicker than notosetae; elytra reticulated ..... *M. hartmanae*, new species
b. Neurosetae thinner than notosetae; elytra not reticulated ..... *M. marquesensis* (Monro, 1928)

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Figure 2. Malmgrenia hartmanae, new species: a, anterior segments, dorsal view, × 72; b, left parapodium from segment 16, anterior view, ×72; c, right elytron from segment 15, dorsal view, × 72; d, detail of right elytron from segment 15, dorsal view, × 325; e, notoseta from segment 16, lateral view, × 325; f–g, neurosetae from segment 16, lateral view, × 325.

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STUDY ON THE DEVELOPMENT OF THE PRIOR RESIDENCE EFFECT IN RAINBOW TROUT (*SALMO GAIRDNERI*)

Thomas R. Payne[1]

Abstract: Hatchery-raised rainbow trout (*Salmo gairdneri*, Richardson) were placed singly in small aquarium tanks for varying periods of time before the addition of a second fish. The effect of prior residence upon dominance between two fish became evident after 12 hours or more had elapsed before the addition of the second fish. The resident was more likely than the intruder to attack first, attacked in a shorter time, and had a higher potential for final dominance. The results may be applicable to the estimation of the carrying capacity of natural waterways and artificial propagation enclosures.

Successful methods for rearing fish in artificial ponds as a commercial enterprise have received a great deal of attention recently. The main cost involved in fish propagation is almost always food, and for this reason, alternative sources of nutrition are constantly being sought. In a continuing study on Humboldt Bay in northern California, an attempt is being made to raise fingerling salmonids to commercial size by utilizing tertiary treated sewage water to stimulate primary productivity in rearing ponds.

Initial difficulties with the project have led to analysis of factors involved in the dynamics of self-supporting ecosystems, and as a result aspects of territorial and dominance behavior in fish were examined. The obvious success of existing private and state hatchery programs employing high-density fish culture indicates that any adverse effects of fish behavior can be overcome by a regimen of heavy supplemental feeding and rapid water exchange.

Aggressive behavior could still possibly play a significant role in determining the carrying capacity of fish ponds which depend on natural or fertilized food sources. With the aim of better understanding the effects of behavior, this study was initiated to analyze the "prior residence effect," which states that a fish familiar with an area has a competitive advantage over a newcomer. If prior residence develops strongly and quickly, then planted fish should tend to remain in small, familiar areas where they are dominant, which is, in effect, territoriality. If territoriality could then be shown to affect carrying capacity, it should be possible to use the strength of the prior residence effect as an indicator of the potential carrying capacity of an artificial pond.

Intraspecific competition and aggression among animal populations serve to establish and maintain the stability and integrity of social structures (Collias, 1944). Chapman (1966) reviewed the most apparent feature of social structure, territoriality, and concluded that it regulates salmonid population density in terms of food and space requirements. Fish which defend territory, apart from the breeding season, have a definite advantage in obtaining food and shelter, grow faster, and survive longer.

An important contributing factor to the outcome of a territorial contest seems to be prior residence. Noble (1939) stated that "mere familiarity with an area gives the resident a decided advantage over a newcomer" in the cichlid jewelfish, *Hemichromis bimaculatus*. Braddock

[1] U.S. Fish and Wildlife Service, Northwest Fisheries Program, 495 Tyee Drive, Tumwater, Washington 98502.